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N. P. Krivosheina, M. G. Krivosheina. NEW DATA ON THE BIOLOGY OF HORSEFLIES FROM THE GENERA *TABANUS* LINNAEUS, 1758 AND *HYBOMITRA* ENDERLEIN, 1922 (DIPTERA, TABANIDAE) REARED FROM WOOD SUBSTRATES. – Far Eastern Entomologist. 2016. N 322: 11-16.

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Summary. Data on the development of larvae of the three Tabanidae species, *Tabanus pleskei* Kröber, 1924, *Hybomitra nigella* Szilady, 1914 and *H. tarandinoides* Olsufjev, 1936, in decaying wood substrates are given for the first time. The description of larvae of *T. pleskei* is added; it differs from larvae of *T. bovinus* Linnaeus, 1758 in the structure of labrum, mandibles and position of chaetoid spots on ultimate body segment.

Key words: Diptera, Tabanidae, *Tabanus pleskei, Hybomitra nigella, H. tarandinoides,* larva, morphology, development, wood substrate.

Н. П. Кривошеина, М. Г. Кривошеина. Новые данные по биологии личинок слепней родов *Tabanus* Linnaeus, 1758 и *Hybomitra* Enderlein, 1922 (Diptera, Tabanidae), выведенных из древесных субстратов // Дальневосточный энтомолог. 2016. N 322. С. 11-16.

Резюме. Впервые приводятся данные по развитию в разлагающихся древесных субстратах трех видов слепней: *Tabanus pleskei* Kröber, 1924, *Hybomitra nigella* Szilady, 1914 и *H. tarandinoides* Olsufjev, 1936. Дополнено описание личинки *T. pleskei*, отличающейся от личинки *T. bovinus* Linnaeus, 1758 строением верхней губы, мандибул и расположением хетоидных пятен на последнем сегменте тела.

Gadflies or Tabanidae represent one of the most investigated groups of Diptera. Larvae are known as typical inhabitants of moist soil, aggregations of silt around banks and on bottom of shallow water reservoirs, including salt ones (Olsuf'ev, 1977).

The development of Nearctic species in decayed wood is known (Teskey, 1976), for example the species of the genus *Leucotabanus* Lutz, 1913 are connected with plantations of trees. Larvae of *L. annulatus* (Say, 1823) were found in fallen decaying tree trunks, stumps and moist wood inside tree holes (Tidwell, 1973), and larvae of *L. ambiguus* Stone, 1938 were discovered in moist decayed wood dust and were always collected in cooperation with certain termite species (Burger, 1977). Up to the present nothing is known on the Palaearctic species with such biology. Our investigations allowed us to register larvae of three Palaearctic species and rear them from decaying tree trunks for the first time. Present study is based on the larval collection of the Institute of Ecology and Evolution (Moscow).

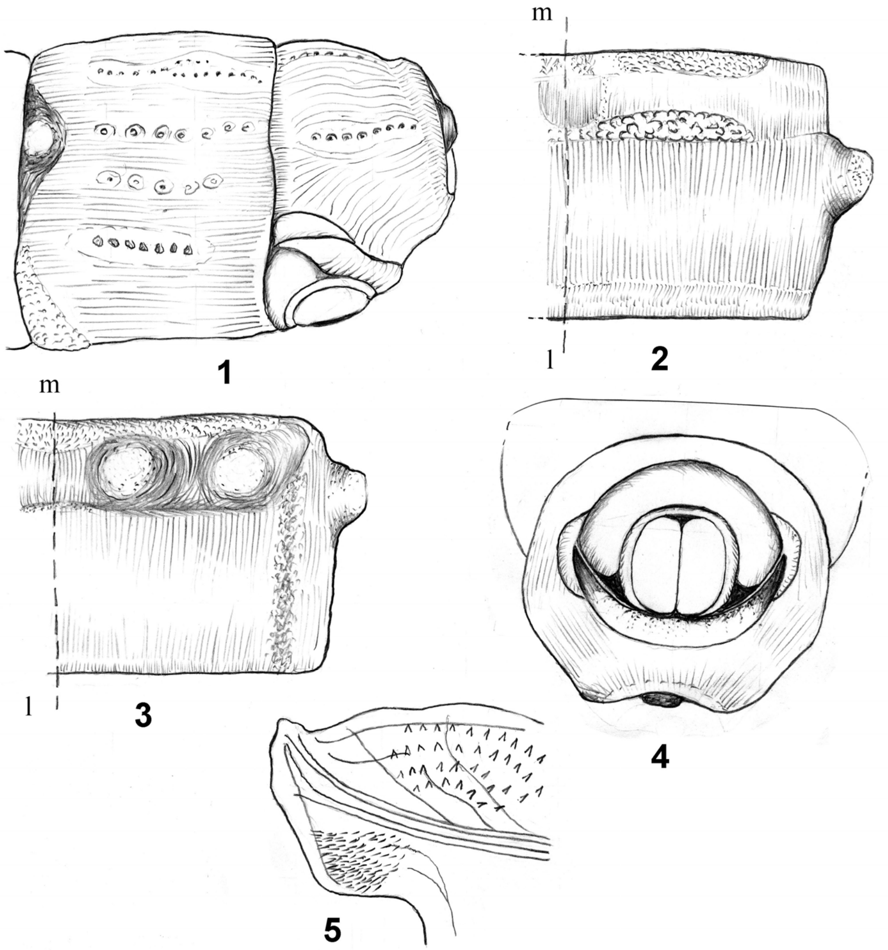
RESULTS

***Tabanus pleskei* Kröber, 1924**

MATERIAL EXAMINED. Larvae of *T. pleskei* were repeatedly collected in the end of May 1967 and 1976 (emerged in the middle of July) in brown wood in roots of *Maackia amurensis* Rupr. and under the bark of fallen *Maackia amurensis* and *Populus* sp. trunks on

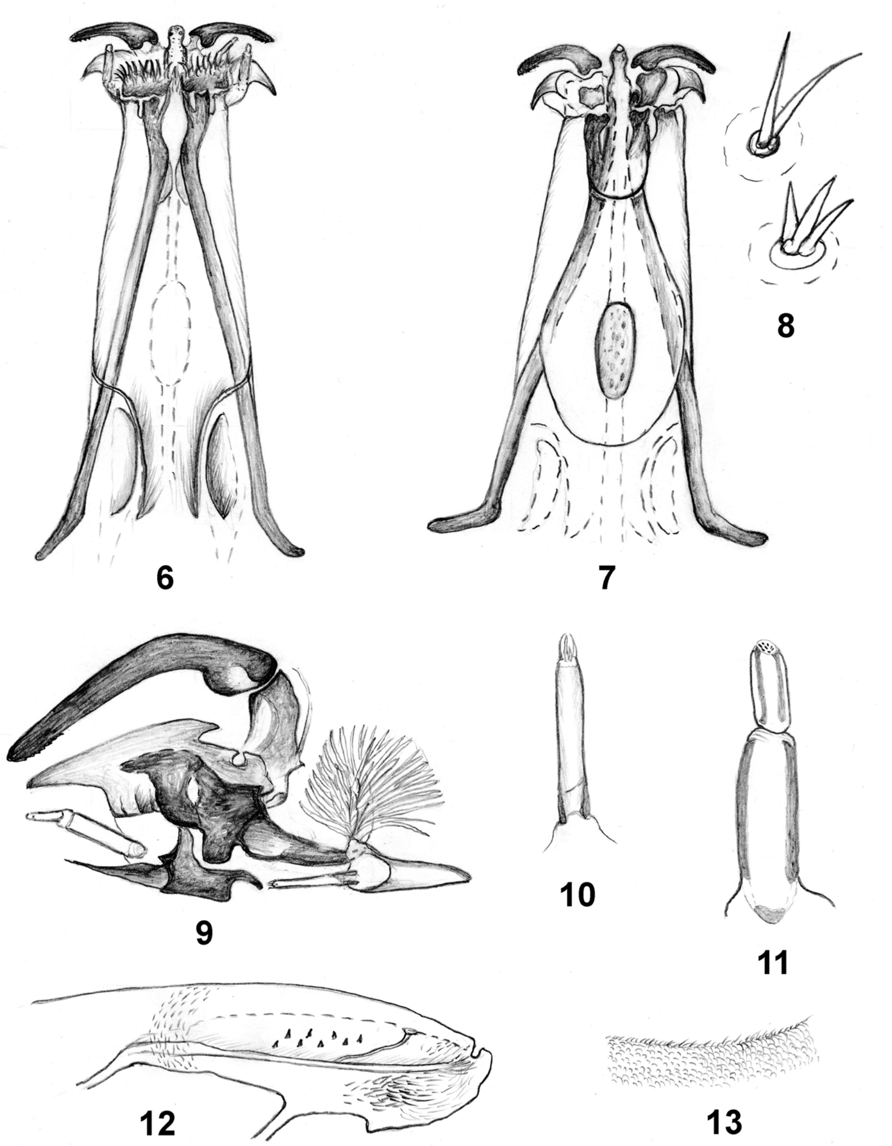
the territory of Kedrovaya Pad Nature Reserve (Primorskii krai) and Khehtsyrskii Nature Reserve (Khabarovskii krai).

DISTRIBUTION. Russia (East Siberia, Far East), Mongolia, China, Korea.



Figs. 1–5. Larvae of *Tabanus pleskei* Kröber, 1924 (1–4) and *T. bovinus* Linnaeus, 1758 (5). 1 – penultimate and ultimate body segments, lateral view; 2, 3 – abdominal segment III dorsally and ventrally; 4 – ultimate body segment, posterior view; 5 – labrum. (Fig. 5 after Andreeva, 1990).

DESCRIPTION. Larva. Body length 35-40 mm, body width 5-7 mm; creamy-white. Head capsule light, weakly sclerotized (Figs 6, 7). Mouthparts are of typical for Brachycera-Orthorrhapha structure. Labrum compressed laterally, its anterior margin is inclined under acute angle to dorsal part of labrum (Fig. 12). Apical projection well developed, blunt and almost rectangular. Dorsal side of labrum with few rare spinules; ventral side of labrum with many apical hairs (Fig. 12). Morphology of mandibles is typical for the representatives of the



Figs. 6–13. Larva of *Tabanus pleskei* Kröber, 1924. 6, 7 – head, dorsal and ventral view; 8 – prothoracic setae; 9 – mandibular-maxillary complex; 10 – antenna; 11 – maxillary palpus; 12 – labrum, lateral view; 13 – structures of chaetoid field on prothorax.

genus *Tabanus*. Distal sclerite of mandible curved at base only, parallel, not pointed and rounded apically (Fig. 9); its ventral 1/4 apical margin with many apical dents directed posteriorly. Maxilla with well developed stipes and lacinia. Maxillar palpus elongate, its basal segment 3 times as long as wide (Fig. 11). Massive transverse sclerite carrying long dense diverging hairs is present at base of mandibular-maxillary complex. This structure was considered as cardo of maxilla by some authors (Bischoff, 1925), by the others – as mandibular brush attached to accessory mandibular sclerite (Teskey, 1981). The latter authors consider ventral oval membranous plate, protruding beyond mandibles and maxillae posteriorly, as labium (Fig. 7). The position of this structure more likely coincides ventral plate of the head capsule of the larvae of lower Brachycera. Salivary reservoir, typical of Tabanidae larvae, is well developed. Antenna narrow, 4-5 times as long as wide, small, significantly smaller than maxillar palpus (Fig. 10).

Larva with smooth thoracic segments without tubercles; abdominal segments with 3 pairs of conical prolegs: 2 lateral and 4 ventral, the latter are converged in pairs; dorsal surface of abdominal segments with 2 flat transverse welts and without prolegs. Chaetoid fields on the anterior part of thoracic segments well developed, concentric, without significant protuberances. Prothoracic field 1/6 as long as the segment; dorsolateral longitudinal furrows begin from it posteriorly but not reaching terminal border of the segment. Thoracic dorsal surface smooth and shining, sometimes with few longitudinal furrows.

Abdominal segments with anterior chaetoid fields interrupted medially and with many distinct longitudinal furrows. Ultimate body segment without developed chaetoid spots (Fig. 1), which are typical for larvae of *T. bovinus*. Anal pad with distinct and well developed pre- and postanal isolated folds (Fig. 1, 4). Length of prolegs of abdominal segments not exceeding their width at base (Figs 2, 3).

REMARKS. The period of larval development of *Tabanus pleskei* in Primorskii krai lasts at least for 3-4 years; larva has 8-10 stages (Soboleva, 1974b). Larvae of this species was briefly described by Soboleva (1970), but was not included in keys published by Andreeva (1990) possibly because of absence of some of important diagnostic characters. Our description of larva allows to clarify these characters.

Tabanus pleskei belongs to *bovinus* species group, represented by few species, the larvae of which have many common features: ultimate body segment with not protruding short siphon; anal pad with distinct and well developed pre- and postanal isolated folds; length of prolegs of abdominal segments not exceeding their width at base; prothorax without lateral chaetoid fields consisting of small hairs, anterior part of prothorax smooth dorsally, shining, with 7-8 rare longitudinal folds. Besides the species is characterized by weak development of dark minute spots, which form longitudinal or inclined rows beginning from anterior chaetoid concentric bands. *T. pleskei* Kröber, 1924 is supposed to replace widely distributed species *T. bovinus* Linnaeus, 1758. The areas of these two species are mutually exclusive: the former species is typical to east territories of Palaearctic region; the latter is abundant from Europe and North Africa to western border of East Siberia. The larvae of these species may be distinguished as follow.

1. Dorsolateral side of ultimate body segment with 3-4 chaetoid spots. Apical concentric chaetoid field occupies 1/4 of the length of prothorax. Anterior margin of labrum forms right angle with its dorsal side (Fig. 5). Apical projection of labrum conical, rounded at apex. Dorsal side of labrum with a field of many spinules forming at least 4 rows. Distal sclerite of mandibles dentate at lower apical half .... ***T. bovinus***

– Dorsolateral side of ultimate body segment without chaetoid spots. Apical concentric chaetoid field occupies 1/6 of the length of prothorax. Anterior margin of labrum forms acute angle with its dorsal side (Fig. 12). Apical projection of labrum well developed, blunt, rectangular at apex. Dorsal side of labrum with few spinules. Distal sclerite of mandibles dentate at lower apical quarter (Fig. 9) .... ***T. pleskei***

***Hybomitra nigella* Szilady, 1914**

MATERIAL EXAMINED. Larvae of *H. nigella* were found 9.V 1975 (emerged 19.VI 1975) inside fallen trunk of bird-cherry tree *Prunus* sp. on the territory of Khinganskii Nature Reserve (Amurskaya oblast).

DISTRIBUTION. Russian Far East, China.

REMARKS. Larvae of *H. nigella* were registered in swamp hillocks, in coastal soil of rivers, springs and bayous; this species is common in taiga zone and takes the second place after *H. taranoides* in abundance.

***Hybomitra tarandinoides* Olsufjev, 1936**

MATERIAL EXAMINED. Larvae of *H. tarandinoides* were discovered 18.IV 1967 (emerged 14.V 1967), under the bark of fallen *Ulmus* trunk covered with moss on the territory of Ussurijskii Nature Reserve (Primorskii krai).

DISTRIBUTION. Russia (from Altai and Kemerovskaya oblast to Primorskii krai), Kazakhstan, Mongolia, China.

REMARKS. The complex of insects in the bark of fallen *Ulmus* trunk in reserve includes also several larvae of *Tipula* Linnaeus, 1758 and colonies of *Bibio* Geoffroy, 1762.

CONCLUSION

While single specimens of larvae of *Tabanus pleskei*, *Hybomitra nigella* and *H. tarandinoides* were found in moist soil along river and spring banks and different water loggings on the territory of deciduous valley forests, cedar-deciduous and mountain mixed forests of Primorskii krai (Soboleva, 1974a, b, 1977; Soboleva *et al*., 1974a, b) but the data on the development of larvae of these species in decaying wood substrates are given here for the first time.

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